STEVEN L. BESHEAR
GOVERNOR

LEONARD K. PETERS
SECRETARY

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION OF WATER
200 FAIR OAKS LANE, 4TH FLOOR
FRANKFORT KENTUCKY 40601
www.kentucky.gov

May 12, 2011

Mr. Ryan Eastwood
City of Ashland
1700 Greenup Avenue
Ashland, KY 41105

RE: City of Ashland
AI # 308
37th St Pump Sta/Force Main Improvements

Dear Mr. Eastwood:

Thank you for submitting a Green Project Reserve (GPR) business case for your proposed project, funded through the Clean Water State Revolving Fund (CWSRF). A provision of the 2011, CWSRF funding cycle requires that to the extent there are eligible project applications; states shall use 20% of its Clean Water State Revolving Fund capitalization grant for green infrastructure projects. These projects are intended to address water and energy efficiency improvements or other environmentally innovative activities. The Kentucky Division of Water (KY DOW) has reviewed the GPR business case for the 37th St Pump Station and Force Main Improvements project, and has found the justification to be acceptable. If the scope of the project is altered in any way to exclude the GPR eligible components, the City of Ashland shall submit the changes in writing to the KY DOW and receive prior approval in writing before proceeding with construction.

We look forward to working with you in finalizing your wastewater infrastructure project. If you have any questions regarding this correspondence, please contact me at (502) 564-3410, ext 4832.

Sincerely,

Greg Goode, P.E.
Kentucky Division of Water

Cc: Tom Schaffer, P.E, HDR Engineering
CWSRF File

Thirty Seventh Street Pump Station and Forcemain Replacement
City of Ashland, Kentucky

Energy Savings

Existing 37th Street Annual Energy usage (kwh)	206,250
Existing 26th Street Annual Energy usage (kwh)	186,000
Total Existing Annual Energy Usage (kwh)	392,250
New 37th Street Annual Energy usage (kwh)	181,250
Total New Annual Energy Usage (kwh)	181,250
Energy saved (kwh)	211,000
%tage of energy saved	**54%**

Project Components

	Total ($)	Applies to Green Component ($)
New Pump Station / Electrical	2,450,000	2,450,000
New 5500 ft 24-inch FM	1,500,000	1,500,000
New 1500 ft 24-inch Sanitary	500,000	0
CSO Regulator Modefications	50,000	0
Total	4,500,000	3,950,000

%tage of project qualifying for GPR = 88%

Clean Water State Revolving Fund Green Project Reserve Eligible Project Components Categorically/Business Case

April 2011

Ashland, Kentucky
37th Street Pump Station & Force Main Improvements

Prepared by:

HDR Engineering, Inc.
2517 Sir Barton Way
Lexington, Kentucky 40509
(859) 223-3755

Prepared for:

City of Ashland.
1700 Greenup Avenue
Ashland, Kentucky 41105
(606) 327-2007

Background

The City of Ashland plans to upgrade the existing 37th Street Pump Station, Force Main, and 37th Street Regulator. The pump station upgrades will include newer, more energy efficient pumps, and a new route for the force main directly to the WWTP. The regulator upgrades will reduce untreated, raw sewage discharge directly into the Ohio River. Additionally, an upgraded gravity line will be necessary to support the function of the upgraded pump station and regulator.

This document is prepared by HDR Engineering, Inc. (HDR) for the City of Ashland. Design of the pump station and other improvements will be completed by HDR. Questions regarding this document should be directed to the following contact person:

Tom Schaffer, PE
HDR Engineering, Inc.
2517 Sir Barton Way
Lexington, Kentucky 40509
(859) 223-3755
Tom.Schaffer@hdrinc.com

The purpose of this document is to identify the components for the referenced project that may be eligible for the Green Project Reserve for the Clean Water State Revolving Fund Loan. The components identified and described in the report include:

Category 3 – Energy Efficiency

- 20% Reduction in Energy Costs.
- VFD installation at pump station

Category 3 – Energy Efficiency

Components of the project are categorically eligible under Energy Efficiency (see 3.2-2 "Projects that achieve a 20% reduction in energy consumption are categorically eligible").

The current pump station and subsequent forcemain routing requires an additional pump station at 26th Street to pump flows into the WWTP. New

force main routing will upgrade the size and change the discharge location. An increase in size will lead to decreased head loss and less energy loss due to friction. This will result in less unnecessary energy loss and a more efficient operation. In addition, the additional capacity realized through these improvements and the new discharge location of the proposed force main will eliminate the need for the 26th Street Pump Station to re-pump flows from the 37th Street Pump Station.

There are currently two pumps operable at 37th Street with only a single VFD. Field tests on separate occasions have verified the flow rate of the operable pumps. Tests also indicate that the pumps are operating slightly off their curves and with some vibration. This indicates less than desirable efficiency in operations. The proposed project will result in two pumps that operate on curve, more efficiently and include new VFDs to operate the pumps at optimum speeds.

The combined effects of a new forcemain, new forcemain routing, and pump station upgrades will result in significant improvements in energy efficiency as detailed below.

Findings/Demonstration of Savings

The following unit cost was determined to estimate the savings from energy efficiency measurements.

- The power cost will be based on an assumed kilowatt hour cost of $0.06.

Category 3 Results

According to records maintained by the City of Ashland, average flow into the WWTP during FY 2010 was approximately 5.9 million gallons per day (MGD). Most of this flow is conveyed to the WWTP through the 26th Street Pump Station, including the current flows from the 37th Street Pump Station. A portion of the costs attributed to the 26th Street Pump Station will be eliminated with new forcemain routing from the 37th Street Pump Station. The average horsepower output for the 26th Street Pump Station will be used to calculate energy consumption.

The current 37th Street Pump Station is a constant 24-hour, 365-day operation. According to operational anecdotes from the City of Ashland personnel, the pump varies its frequency to match flows received to the wet well and maintain a constant level. During the peaks and low flows, the operational speed of the pump will fluctuate, causing some rises and dips of horsepower. An average horsepower is used for the calculations presented.

Energy consumption and cost of operation at the 37th Street Pump Station is as follows:

- Power Consumption: (90 hp)(.746 kw/hp)(24 hr/day)(365 days/yr) = 588,146 kw-hr / year
- Cost: (588,146 kw-hr)($0.06/ kw-hr) = $35,288 / year

Energy consumption and cost of operation at the 26th Street Pump Station is as follows:

- Power Consumption: (150 hp)(.746 kw/hp)(24 hr/day)(365 days/yr) = 980,244 kw-hr / year
- Cost: (980,244 kw-hr)($0.06/ kw-hr) = $58,814 / year
- Allocated cost of 26th Street Pump Station based on flows received from the 37th Street Pump Station: $58,814 (35%) = $20,585
- Total cost: Pumping costs at 37th Street + Allocated pumping costs at 26th Street Pump Station: $20,585 + $35,288 = $55,873

The 37th Street Pump Station improvements and new forcemain routing will have a significant energy and savings impact on operations. The total operational times and flows will be assumed when comparing the pump station operation before and after improvements. However, due to the VFD installation, pump upgrades, and new forcemain routing, the average horsepower is reduced at the 37th Street Pump Station. Also, as previously noted, the 26th Street Pump Station will no longer be affected by the flows from the 37th Street Pump Station and no costs will be allocated.

The energy consumption and cost of operation for the improved 37th Street Pump Station is as follows:

- Power Consumption: (80 hp)(.746 kw/hp)(24 hr/day)(365 days/yr) = 522,796 kw-hr / year
- Cost: (522,796 kw-hr)($0.06/ kw-hr) = $31,367 / year

The total cost of operation from the proposed 37th Street Pump Station improvements and new forcemain routing is projected at a 43% reduction (approximately $24,506) in annual pumping costs associated with the 37th Street Lift Station.

Summary and Conclusions

By constructing the new pump station and forcemain, the City of Ashland is expected to realize a significant savings (43%) in operations costs due to the increased efficiency from lift station and force main improvements o the 37th Street Lift Station. This level of savings is substantially greater than the 20% minimum savings outlined in the Green Project Reserve program. The information provided herein should be sufficient to illustrate program compliance for the purpose of securing those funds.